



(Red-lined version) PLANT PATENT

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APPLICATION FOR UNITED STATES PLANT PATENT

for

CHRYSANTHEMUM PLANT NAMED 'NIRVANA IMPROVED'

by

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This application claims the benefit of U.S. Provisional Application No. 60/396,824, filed July 17, 2002.

LATIN NAME OF THE GENUS AND SPECIES

5 Botanical classification: ~~*Dendranthema grandiflora*~~ *Chrysanthemum morifolium*.

VARIETY DENOMINATION

The new *Chrysanthemum* variety denomination is 'Nirvana Improved.'

BACKGROUND OF THE INVENTION

The present invention comprises a new and distinct cultivar of
10 *Chrysanthemum* botanically known as ~~*Dendranthema grandiflora*~~ *Chrysanthemum morifolium*, and referred to by the cultivar name 'Nirvana Improved'.

'Nirvana Improved', identified as 20668-1, originated from a cross made in a controlled breeding program in Cleangro Limited, Vinnetrow Road, Chichester, West Sussex PO10 7XQ, United Kingdom. The female parent of the new variety is an
15 undistributed, unpatented seedling identified as ~~P452C7~~ 'P452C7'. The male parent of the new variety is an undistributed, unpatented seedling identified as ~~20038-0~~ '20038-0'. The new variety 'Nirvana Improved' has been asexually reproduced by vegetative cuttings in Chichester, West Sussex, United Kingdom, and the distinguishing characteristics are retained through successive generations of asexual reproduction.

20 BRIEF SUMMARY OF THE INVENTION

'Nirvana Improved' is a pot type of *Chrysanthemum* plant variety having yellow and red single flowers with a light green disc.

Comparison with Female Parent

Plants of the new *Chrysanthemum* variety 'Nirvana Improved' are dissimilar
25 to the female parent cultivar 'P452C7' in plant habitat and growth rate. In side-by-side comparisons in Chichester, West Sussex, United Kingdom, under commercial

practice, plants of the new Chrysanthemum variety 'Nirvana Improved' differed from plants of the parent ~~cultivar~~ 'P452C7' in the following characteristics.

1. The new variety 'Nirvana Improved' produces yellow and red single flowers whereas the parent ~~cultivar~~ 'P452C7' produces white and purple flowers ~~flowers~~.
2. Plants of the new variety 'Nirvana Improved' have larger and taller inflorescence than plants of the parent ~~cultivar~~ 'Nirvana Improved' 'P452C7'.

Comparison with Male Parent

Plants of the new Chrysanthemum variety 'Nirvana Improved' are dissimilar to the male parent '20038-0' in plant habitat and growth rate. In side-by-side comparisons in Chichester, West Sussex, United Kingdom, under commercial practice, plants of the new Chrysanthemum variety 'Nirvana Improved' differed from plants of the parent '20038-0' in the following characteristics.

1. The new variety 'Nirvana Improved' produces yellow and red single flowers whereas the parent '20038-0' produces red single flowers.
2. Plants of the new variety 'Nirvana Improved' have larger and taller inflorescence than plants of the parent '20038-0'.

Comparison with Other Varieties

Plants of the new Chrysanthemum variety 'Nirvana Improved' are similar to the ~~cultivar~~ 'Machismo Time' (U.S. Plant Patent Application Ser. No. 09/957493 Publication No. US 2003/0056261) in plant habitat and growth rate. However, in side-by-side comparisons in Chichester, West Sussex, United Kingdom, under commercial practice, plants of the new Chrysanthemum variety 'Nirvana Improved' compared to plants of the ~~cultivar~~ 'Machismo Time' in the following characteristics.

1. The new variety 'Nirvana Improved' produces yellow and red single flowers whereas the ~~cultivar~~ 'Machismo Time' produces yellow and red single flowers.

2. Plants of the new variety 'Nirvana Improved' have larger and taller inflorescence than plants of the cultivar 'Machismo Time'.
3. The flowers of the new variety 'Nirvana Improved' have more yellow contrast than 'Machismo Time'.

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BRIEF DESCRIPTION OF ILLUSTRATIONS

Typical specimens of the plant and flowers for the new Chrysanthemum variety 'Nirvana Improved' are shown in the accompanying digital photograph. The colors shown are as true as possible within the usual limits of this kind of illustration. Figure 1 is a whole plant view of the new variety 'Nirvana Improved' grown in a pot.

- 10 The plant shown in the illustration and described here is 52 days from the commencement of Short Days.

DETAILED BOTANICAL DESCRIPTION

The following description of the new Chrysanthemum variety 'Nirvana Improved' is of plants grown in a greenhouse in Chichester, West Sussex, United Kingdom, in the month of February. The cultivar has not been observed under all possible environmental conditions. The phenotype may vary significantly with variations in the environment such as temperature, length of day and light intensity, without any variance in genotype. The commercial classification of the new variety is a pot Chrysanthemum.

- 20 Plants of the new variety have been grown successfully under temperature conditions averaging about 18°C at night and about 24°C to 25°C during the day under light conditions of about 5000 to 6000 foot candles. The plants respond well to the use of growth retardant, such as B9 treatment. To produce a commercial product the plants may be pinched once with the center bud removed. The typical container
- 25 size for commercial growth is 14 cm. It has been observed that the shelf life of the new variety is about 24 days with a response time of about 7.5 weeks. The new variety is suitable for growth in a temperature range of 17°C to 28°C.

The following description is with respect to a plant produced as pot Chrysanthemum. In the description of this new Chrysanthemum variety, color values have been taken from the Royal Horticultural Society Colour Chart (R.H.S.C.C.).

Plant

- 5 Plant type: Pot
Habit: Upright and free branching
Height: 21 cm
Width: 36 cm
Branching characteristics: Upright and free branching
- 10 Length of Lateral Branches: 5-12-16 cm
Diameter of Lateral Branches: 0.7 cm
Textture of Lateral Branches: Slightly pubescent
Number of Breaks from Pinch: 3-5
Stem Length: 5.5 cm
- 15 Stem Diameter: 0.6 cm
Stem Color: 137C
Stem Texture: Slightly pubescent
Response Time: 52
Vigor: Medium / Tall
- 20 Shelf Life: 24 days
Disease/Pest (Susceptibility/Resistance observed): None observed to date
Growth retardant type and treatment: 3 applications of 2.5 gm/litre liter B9 @ 2, 21 and 28 days after sticking of unrooted cuttings.
The plants were grown for 3 weeks in Long Day conditions (20 hours of light) and
- 25 then transferred to Short Day conditions (13 hours of dark).
Propagation:
Type: Vegetative Propagation Via Stem Cuttings
Time to rooting: 12-14 days with soil temperatures of 18°C
Rooting habit: Fine and Fibrous

Foliage

Number of Leaves Per Lateral Branch: 8-11

Compound or single: Single

Arrangement of Leaves: Alternate

- 5 Shape of Leaf: typically 5 lobed ovate
 Size of Leaf: *Width (cm): 5-8.5 cm Length (cm): 3-10 cm*
 Leaf Apex: Acute
 Base: Cordate
 Attachment: Petioled
- 10 Aspect: Slightly undulating
 Margin: Palmetely lobed
 Surface characteristics: *Top: Slightly pubescent*
 Bottom: Pubescent
- Petiole: *Color: 139C*
 15 *Length: 0.5-2.5 cm*
 Diameter: 0.2 cm
 Texture: Slightly pubescent
- Venation: Net prominent midvein at underside
 Color: upper side: Near 138B
 20 *under side: Near 138B*
- Color: Mature Leaf, *upper side: Near 137A; under side: Near 137B*
 Young Leaf, *upper side: Near 137B; under side: Near 138A*

Flower

Flower appearance: Matte

Flower type: Single

Flower form: Flat

5 Flower shape: Circular

Flower habit: Flat Capitulum

Number of blossoms per branch: 3-5

Typical flowering season: January - December

Inflorescence form: Cyme

10 Depth of fully expanded blossoms: 1.5 cm

Diameter of fully expanded blossoms: 9 cm

SepalsPhyllaries:

Number: 25-30

Outer Color: Near 137C

15 *Length:* 0.5-0.9 cm

Width: 0.2-0.5 cm

Texture/Appearance: Pubescent

Peduncle: peduncle length is shortest at the terminal flower and progressively longer
20 moving down the stem.

Length: 3-4012 cm, average 5 cm

Color: Near 137D

Diameter: 0.7 cm

Surface: Pubescent

25 *Habit:* Slightly curving

Strength: ~~Medium~~ Moderately strong

Pedicel:

Length: terminal: 3-6 cm; lateral 5-8 cm

Diameter: 0.3 cm

30 *Color:* Near 139C

Surface: Pubescent

Habit: Slightly curving

Strength: ~~Medium~~ Moderately strong

Ray Florets florets:

- 5 *Form/Shape:* Straight with parallel edges to the central mid-vein and a rounded tip

Texture/Appearance: Matte

Number per flower: 30

Length: 2.5 cm; *Width:* 0.8 cm

- 10 *Apex:* Rounded

Base: Tapered

Margin: Entire

Disc florets:

Form/Shape: Cylindrical

- 15 *Texture/Appearance:* Shiny

Number per flower: 150-200

Length: 0.6 cm; *Width:* 0.1 cm

Diameter of disc: 1.5 cm

Fragrance: None

- 20 Flower Bud (at onset of color):

Length: 0.5 cm

Diameter: 1 cm

Form/shape: Globular

General flower color:

- 25 1. Ray florets, *upper side*:

Immature: ~~Near 16B and 44B~~ Near 44B from base to center and 16B from center to apex

Mature: ~~Near 16C and 44B~~ Near 44B from base to center and 16C from center to apex

Older/Fading: ~~Near 16C and 44C~~ Near 44C from base to center and 16C from center to apex

5 2. Ray florets, *under side*:

Immature: ~~Near 16C and 44B~~ Near 44B from base to center and 16C from center to apex

Mature: ~~Near 16D and 44B~~ Near 44B from base to center and 16D from center to apex

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Older/Fading: ~~Near 16D and 44B~~ Near 44B from base to center and 16D from center to apex

3. Disc florets:

Immature: Near 143C

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Mature: Near 151B

Older/Fading: Near 151D

4. Bud: 44C

Flower progression with age: Flower form does not change but there is a slight fading of color.

20 Lastingness of blooms: about 24 days

Reproductive Organs

Gynoecium observed on Ray and Disc florets.

25 Ray Florets florets per individual flower: Pistillate

Pistil Number: >25

Stigma color: Near 7A

Stigma shape: Forked

Style Color: Near 145C

Style Length: 0.4 cm

5 Disc Florets florets per individual flower: Pistillate

Pistil Number: >25

Stigma color: Near 7A

Stigma shape: Forked

10 *Style Color:* Near 145C

Style Length: 0.4 cm

~~Staminate: none observed to date~~

15 Androecium not observed.

Fruit and Seeds: None observed to date

WHAT IS CLAIMED IS:

1. A new and distinct variety of Chrysanthemum plant, substantially as described and illustrated herein.

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ABSTRACT

A new variety of Chrysanthemum plant named 'Nirvana Improved,' having a good uniform canopy of large yellow and red single flowers with a green disc. The new variety has medium to tall ~~vigour~~vigor with a flat capitulum, free branching,
5 uniform spreading habit and good foliage presentation.